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The Public Health Journal

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The Story of Small-Pox Among the Indians of Canada

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Our earliest records of small-pox among the Indians of Canada are to be found in the Jesuit Relations. Scattered through the numerous volumes which comprise this treasure trove of early Canada are many references to small-pox. It existed, we find, in the year 1635, among the Montagnais Indians, who dwelt along the banks of the St. Lawrence. In Le Jeune's Relation of that year he says: "I know indeed that the greater part of the Montagnais who were at Three Rivers when we embarked were sick, and many of them died; and that no one who returned by canoe from trading was not affected by the contagion. It has been so universal among the savages of our acquaintance that I do not know of one who has escaped its attacks. All of these poor people have been much inconvenienced by it, particularly during the autumn, as much in their fishing as in their harvesting. Many crops are lying beneath the snow; a large number of persons are dead; there are still some who have recovered."

The efforts of the Jesuits to Christianize the Algonquin tribe were unsatisfactory, and they established at 'Ihonatiria,' in the neighbourhood of Georgian Bay, a mission among the Hurons, who seemed to offer more hopeful material than the Algonquins. Soon after they established their mission among the Hurons, small-pox, brought from the lower St. Lawrence, broke out and decimated the Hurons. The disease was ascribed to the 'medicine' of the black-robes.

(Read Before the Canadian Historical Association at Montreal, June, 1925.)

In the year 1636 we find that, "the pestilence which for two years past had from time to time visited the Huron towns, now returned with ten-fold violence, and with it soon appeared a new and fatal scourge—the small-pox. Terror was universal. The contagion increased as autumn advanced; and when winter came, far from ceasing as the priests had hoped, its ravages were appalling. The season of Huron festivity was turned to a season of mourning; and such was the despondency and dismay, that suicides became frequent. The Jesuits, singly or in pairs, journeyed in the depth of winter from village to village, ministering to the sick, and seeking to commend their religious teaching by their efforts to relieve bodily distress. No house was left unvisited. As the missionary, physician at once to body and soul, entered one of these smoky dens, he saw the inmates, their heads muffled in their robes of skins, seated around the fires in silent dejection. Everywhere was heard the wail of the sick and dying children; and on or under the platforms at the sides of the house crouched squalid men and women, in all the stages of the distemper."

"Let us come," says the historian, "to the disease, which, having put everything in desolation, gave us much exercise, but was also an occasion of much consolation to us, God having given us scarcely any other harvest from that quarter. It was upon the return from the Journey which the Hurons had made to 'Kebec' that it started in the country—our Hurons, while again on their way up here, having thoughtlessly mixed with the Algonquins, whom they met on the route, most of whom were infected with small-pox. The first Huron who introduced it came ashore at the foot of our house, newly built on the bank of a lake—whence being carried to his own village, about a league distant from us, he died straightway after.

"Without being a great prophet one could assure one's self that the evil would soon be spread abroad through all these regions; for the Hurons—no matter what plague or contagion they may have—live in the midst of their sick, in the same indifference, and community of all things as if they were in perfect health. In fact, in a few days, almost all of those in the cabin of the deceased found themselves infected; then the evil spread from house to house, from village to village, and finally became scattered throughout the country.

"The villages nearer to our new house having been the first ones attacked, and most afflicted, the devil did not fail to seize his opportunity for reawakening all the old imaginations, and causing the former complaints of us, and of our sojourn in these quarters, to be renewed; as if it were the sole cause of all their misfortunes, and especially of the sick. They no longer speak of aught else; they cry aloud that the

French must be massacred. These barbarians animate one another to that effect; the death of their nearest relatives takes away their reason, and increases their rage against us so strongly in each village that the best informed can hardly believe that we can survive so horrible a storm. *They observed with some sort of reason that since our arrival in these lands those who had been the nearest to us had happened to be the most ruined by the disease, and that whole villages of those who had received us now appeared utterly exterminated;* and certainly, they said, the same would be the fate of all the others if the course of this misfortune were not stopped by the massacre of those who were the cause of it.

"This was a common opinion not only in private conversation but in the general councils held on this account, where the plurality of votes went for our deaths—there being only a few elders who thought they greatly obliged us by resolving on banishment. What powerfully confirmed this false imagination was that, at the same time, they saw us dispersed throughout the country—seeking all sorts of ways to enter the cabins, instructing and baptizing those most ill with a care that they had never seen. No doubt, they said, it must needs be that we had a secret understanding with the disease, (for they believe that it is a demon), since we alone were all full of life and health, although we constantly breathed nothing but a totally infected air—staying whole days close by the side of the most foul smelling patients, for whom everyone felt horror; no doubt we carried the trouble with us, *since wherever we set foot, death or disease followed us.*

"These tribes believe that we poison and bewitch them, carrying this so far that some of them no longer use the kettles of the French. They say that we have infected the waters, and that the mists which issue thence kill them; that our houses are fatal to them; that we have with us a dead body which serves us as black magic; that, to kill their children, some Frenchmen penetrated the horrid depths of the woods, taking with them the picture of a little child which we had pricked with the points of an awl, and that therein lay the exact cause of their death. They go even farther,—they attack our Saviour, Jesus Christ; for they publish that there is something, I know not what, in the little Tabernacle of our chapel, which causes them to die miserably.

"In consequence of all these sayings, many had us in abomination; they expelled us from their cabins, and did not allow us to approach their sick, and especially children; not even to lay eyes on them—in a word, we were dreaded as the greatest sorcerers on earth. Wherein truly it must be acknowledged that these poor people are in some sense excusable. For it has happened very often, and has been remarked

more than a hundred times, that where we were most welcome, where we baptized most people, there it was in fact where they died the most; and, on the contrary, in the cabins to which we were denied entrance, although they were sometimes sick to extremity, at the end of a few days one saw every person prosperously cured."

The Indians ordered the missionary clock to be stopped, saying that every time it struck it marked the death of a Huron. Even the weather-vane on the house of the priests was under suspicion, for they said whatever way it pointed it meant death to the sick. A painting in the Jesuit chapel, representing the suffering of the damned, excited them as though the flames were the burning fever which devoured their dying, and the demons, monsters that held them in the throes of disease until they were dead. Seeing that these charges might end in disaster to the mission, Father Brebeuf summoned a meeting of the chiefs. They met in council, twenty-eight towns being represented. The chiefs accused the priests of being sorcerers. Brebeuf explained to them that small-pox was a contagious disease and told them how it spread. They told him that he was a liar and that he ought to be killed. The meeting lasted until midnight, and when Brebeuf was leaving the tent an old warrior shouted, "If some one would split your head, none of us would regret it." An attempt was made to burn the cabin of the missionaries, and a band of young warriors met secretly and determined to kill them as soon as their elders had left for the autumn fishing.

However, while threats and a show of force were made by the Indians, there were no deaths—"for all these threats have had but little effect—we are alive and, thank God, all full of life and health." "It is indeed true that the crosses have been stricken from above our houses; that people have entered our cabins, hatchet in hand, in order to deal some evil blow there; they have, it is said, awaited some of ours on the road, with the intention of killing them; the hatchet has been lifted above others, and the blow brought within a finger-length of their bare heads; the crucifixes which were carried to the sick have been violently snatched from us; blows from a club have been inflicted upon one of our missioners, to prevent him conferring some baptisms."

The villages which were infected with small-pox at this time seem to be chiefly those of St. Joseph, St. Michel and St. Ignace, of the Huron country—between Lake Simcoe and Lake Huron.

It would appear that the deaths among children were numerous. To quote, "the number of baptized in this single village, since the last Relation, has risen to more than two hundred and sixty, of whom more than seventy children under seven years died."

Speaking of the antipathy of the Indians who blame them for giving

them the disease, Father Ragueneau says: "In fact, on the round we have just made, we have found everywhere the cabins closed; and several who saw themselves surprised before they had contrived to anticipate our arrival, forthwith drove us out; others said that they were deaf, and even maliciously stopped their ears for fear of hearing us; some acted as madmen and lunatics, and exclaimed that they could not bear the sight of us; in a word they will not hear what they are not persuaded to do."

In St. Therese Father Ragueneau had a worse reception. He says: "A young man forcibly seized the crucifix which I wore about my neck, takes a hatchet in his hand and says that positively I should die. He lifts the hatchet directly above the middle of my head—then uncovered —and deals his blow so steadily that Father Chaumonot and I think to see at that moment what we have so long desired. I know not what stopped the blow, unless the greatness of my sins; but short of feeling the hatchet cleave a head in twain, one cannot see one's self closer to death. He is fain to repeat his stroke; a woman stops his arm and seizes him."

Small-pox at this time apparently ravaged the whole Huron country. Everywhere the missionaries went they found the sick, the dead and the dying. For example: "On our way to a place, we go astray unawares, and find ourselves in routes that we were not seeking. We meet two little children who are dying—prostrate near their mother, who is all in tears." "I set foot in a poor little house where I had never entered; I find a young lad in very great danger of dying." "I pass near a cabin where three little children are dying," etc.

This epidemic among the Hurons would appear to have been at its height in the year 1636, and to have continued intermittently until the year 1640.

Twenty years afterwards small-pox again raged. The Attikamegues, or nation of the White Fish, who were a Montagnais tribe dwelling along the upper St. Maurice river, were practically wiped out by it. The chronicler tells us that: "By the year 1661 they had been practically wiped out by the Iroquois, and their ruin was completed a few years later by the ravages of small-pox."

In the Relation of 1661-1662 the following reference is made to the epidemic of these years: "The small-pox gathered in a rich harvest of those innocent souls; for, of more than two hundred who received Holy Baptism during the winter, there were over six score who died soon after, to take their flight to heaven."

In 1663 small-pox is mentioned as being present among the Iroquois. "The small-pox, which is the American's pest, has wrought sad havoc

in their villages, and has carried off many men, besides great numbers of women and children; and as a result their villages are nearly deserted, and their fields only half tilled." "More than three hundred dying children were baptized by some captive Frenchmen."

Small-pox was still present among the Iroquois in 1664-1665, and "swept away more than a thousand souls." Small-pox, war and alcohol finally played havoc with the Iroquois, and by the year 1680 they were only a weakened remnant of the fierce and warlike nation that had wiped out so many other tribes, and that so often came boldly down to attack the French in their own forts at Three Rivers, Quebec and Montreal.

In 1669-1670 small-pox was again present among the Algonquins and Montagnais, who dwelt near Tadoussac, on the banks of the St. Lawrence. "The small-pox—which makes as great ravages among these people as the plague—and the extremes of cold and hunger have been the principal evils that have afflicted this miserable colony; they have swept away from it about two hundred and fifty persons—both Montagnais and Algonquins, Papinachois and Gaspesians—from the missions of Sillery and from Tadoussac." In fact, the trading-post at Tadoussac, so long a centre of attraction, was almost abandoned.

In a letter from Father Albanel, who had been sent out by 'Talon,' is the following reference to the disease in the neighbourhood of Tadoussac: "On the 28th day of November the French Shallop which had brought me hither arrived, loaded with fifteen or twenty sick persons. They all resembled monsters rather than human beings, their bodies were so hideous, emaciated, and full of corruption. On the fifth day of the same month some Frenchmen went down to Isle Verte, which is not far distant from Tadoussac, and is formed by our great river St. Lawrence. They found a cabin full of dying persons, and came to beg that I would go and render them all the assistance I could. I arrived on the Island and saw there only living skeletons and bodies all disfigured." Father Albanel himself took the disease, but recovered.

In September, 1671, Father Albanel halted a few days among the 'Kakouchue,' who dwelt on the banks of Lake St. John, on his way to Hudson Bay. He says: "The inhabitants have been greatly diminished in numbers by the late wars they have carried on with the Iroquois, and by the small-pox." Father Albanel reached the shores of James Bay the following year and took possession of this region for France.

Father E. J. Devine, in his "History of Caughnawaga," writes of an epidemic of small-pox that broke out among the Indians at 'Kahnawake' in the year 1678 and took its toll of lives. A remnant of this tribe still lives in Caughnawaga on the St. Lawrence near Montreal.

M. du Chesneau, in a communication to M. de Seignelay dated November 13th, 1681, notes that "There have not been any great complaints this year, because we have forbidden the coming down of ninety canoes belonging to Ottawas heavily laden with peltries, through apprehensions of the small-pox (peste), which was introduced among that people by well known vagabonds (libertins), against whom the governor was unwilling that information should be lodged."

In a letter of Father Jacques Bigot respecting the mission at Sillery, which was written in the year 1682, he says: "Since my brother's departure nearly all our savages have been attacked by small-pox, which has given me no slight occupation. I had all the symptoms of the disease myself for some days, and I thought that I also would have my share of it."

In the year 1694 there was an epidemic among the Indians of Maine and Acadia. At Medoctec alone over a hundred persons died. In 1702 we find the disease still present in the community.

While accounts of small-pox among the Indians of Canada in those early days refer most frequently to the regions about Quebec, Three Rivers and Lake Huron, mention is made of the fact that the disease had reached Tadoussac in the east and had spread as far west as Sault Ste. Marie. Three Rivers was a convenient gathering-place for the fur trade, and it therefore acted as a meeting-place for the Indians of the various tribes and the traders. It was also a port of departure for the voyagers and traders, and as a result it acted as a focus for the spread of small-pox.

Tadoussac, on the St. Lawrence in the lower part of the country, had from the earliest historic times been a favourite harbour and trading station for the French; for, being at the junction of two great rivers, it was convenient as a place of assembly for the lower and eastern part of the country. It was also a point of departure for the north by way of the Saguenay, and was, likewise, a focus for the spread of infection. The Montagnais, among the earliest sufferers from small-pox, occupied territory along both banks of the St. Lawrence; and other tribes, such as the Bersiamites, Porcupines, Oumaniweks, Papinachois, had their villages in this neighbourhood, and were in turn infected.

The Algonquins, about 50,000 in number, who were also victims of the disease during these years, held the greater part of the country from Kentucky northward to Hudson Bay, and from the Atlantic westward to the foot-hills of the Rockies.

In the Upper Lakes region where the disease was present were the Ottawas, The Nation of the Isle, who claimed to be the true Algonquins, Chippewas, Mascoutens, Nipissings, Foxes, Pottawattomies and Illinois.

The Hurons, about 16,000 in number, who suffered most greatly from small-pox, dwelt in several large villages on the high ground between Lake Simcoe and Georgian Bay of Lake Huron.

Further in along the shores of Lake Superior were the Ojibways, and in the western plains the Crees and Blackfeet. Further west the Arthapascans ranged along the Mackenzie, extending into Alaska. The Iroquois dwelt along the southern shores of Lake Ontario, from the Hudson to the Genesee. All of these suffered from small-pox.

There is no doubt that the Abenakis, who were an Algonquin tribe known to the French as the Souriquois, and who dwelt in Maine, Acadia and Cape Breton, also suffered from the disease at or before this time; although the first direct reference to the disease among the Abenaquois Indians of Acadia is in 1735.

Following this period, the history of small-pox among the Indians becomes largely merged with that of the French colony.

There was nothing to stay the deadly progress of the disease in those days, and every effort was made to prevent its entrance and progress throughout the country. We see an effort in this direction in the letter of Messrs. Beauharnois and Hocquart to Count de Maurepas, Quebec, 1st October, 1731: "'Tis true that I had sent orders, at that time, to the domiciliated Indians not to go to New England, and had forbidden the officers at the Posts to allow any Englishmen to pass, because I was informed that the Small-pox, which is a dangerous disease in this hemisphere, was committing great ravages there." These brief references do not tell half the tale. The Indians did not know how to treat the disease, with the result that during each succeeding epidemic tribes were practically wiped out.

In 1733 the disease was still taking its accustomed toll of life, for we find the usual brief reference to its presence in a letter from M. le Normant, June, 1733, at Louisburg, to M. de St. Ovide, that Mr. Hocquart has written him that small-pox has reigned all winter in Canada and half the Sounontouans died of the disease.

In 1735 the disease was present among the Abenaquois Indians. In a letter dated at Versailles, August 11, 1738, we read: "His Majesty is happy that the Indians who left St. Francois de Becancourt, on account of the small-pox, and went to Acadia, have returned to their villages as soon as the fear of the disease was dissipated."

There are references to epidemics from year to year too numerous to mention here. The following incident is, however, worthy of note:

In 1738 small-pox broke out among the Monsoni, Crees and Assiniboines when they were marching on the Sioux, who had massacred the French at the Catholic Mission on Lake Pepin. The story of the

massacre is as follows: In the spring of 1736 provisions were at a premium at Fort St. Charles, Lake of the Woods. The commander of the Fort, Laverendrye, was obliged to dispatch three canoes to Michillimackinac, his nearest base of operations, for supplies. Father Aulneau, the Jesuit missioner, made up his mind to make the journey to Michillimackinac with them. They left on June 8th, 1736, in canoes manned by nineteen voyageurs, following in the wake of five other French employees who had left for the same destination on the third of the same month. This party of five men on the following day, the 4th of June, came in sight of thirty war canoes manned by ninety or a hundred Sioux warriors, who at once surrounded them and tied them up, preparing to torture them, claiming that the French had fired upon them. The French denied this, saying that the firing had been done by a party of Crees who had five or six tepees near the French fort. The Sioux released the French after taking away their arms and ammunitions and set out for the tepees of the Crees. They were unable to find these, and returned to wreak vengeance upon the French for their apparent deception, only to find that they had decamped. Meanwhile, Father Aulneau and the others had encamped on an island about twenty miles south of Fort St. Charles. The Sioux, who were now thirsting for blood, found them there and massacred them.

On the 16th of September, 1736, a Sioux chief went to Fort Beauharnois. It was noticed that he had a silver seal suspended from his ear, which on examination proved to be that of Father Aulneau. At this sight the French Commander became enraged and tore it off with part of the Indian's ear. Shortly thereafter the Sioux burned the fort of a tribe allied to the French, and tore up and burned the fence of the Catholic Mission on Lake Pepin. The Crees and Monsoni, to the number of 250 warriors, determined to avenge the French, and set out for the land of the Sioux. At the same time about eight hundred Assiniboines took to the war-path with the same object in view. The outbreak of small-pox among them paralyzed their movements and ended their quest for vengeance. This shows that by that year, 1738, the disease had spread as far as the western borders of Manitoba and the North-West Territories.

In the year 1757 Montcalm, with a force of 6,000 French and 2,000 Indians, made a dash at Fort William Henry. Here there were about 2,500 men, under the command of Colonel Munro; while at Fort Edward, about fourteen miles off, there were as many more under General Webb. Munro, seeing himself outnumbered, appealed to Webb for assistance. Webb refused, and the French were victorious. Fort William Henry fell into their hands. The fort was small and unsanitary,

and small-pox was raging. The Indians butchered the inhabitants and plundered and looted the fort, although Montcalm risked his life to stop them. Just retribution in the way of small-pox overtook them, and we read in a letter from Montcalm to M. de Paulmy, dated Montreal, 18th April, 1758, the following: "A number of the upper country Indians, who came last year to the expedition against Fort William Henry, died of the small-pox on their way home. The English had it. This is a real loss to us, and will cost the King considerable in consequence of the expenses it will occasion at the posts to treat them, cover the dead and console the widows. Fortunately, they have always declared, in the different councils held at Michillimackinac, Detroit, etc., that *the English had thrown that medicine on the Indians* which they might have turned aside had they been willing to believe the French general and not plunder the baggage of the English."

In 1802 or 1803 small-pox made its appearance among the Indians residing at Sault Ste. Marie, but it did not extend to the bands west from that place. The disease was introduced by a voyageur, in the employ of the North-West Fur Company, who had just returned from Montreal; and although all communication with him was prohibited, an Indian imprudently having made him a visit, was infected with and transmitted the disease to others of the band. When once communicated, it raged with great violence, and out of a large band, scarcely one of those then at the village survived; "and the unburied bones still remain, marking the situation they occupied." From this band the infection was communicated to a band residing upon St. Joseph's Island, and many died of it; but the surgeon of the military post then there succeeded, by judicious and early measures, in checking it before the infection became general.

Vaccination with cow-pox was introduced among the Indians about the year 1807, and the Indians' appreciation of vaccination is shown by the following letter sent by the Five Nations Indians, assembled at Fort George, in Upper Canada, November 8th, 1807, to Edward Jenner:

"Brother, Our Father has delivered to us the book you sent to instruct us how to use the discovery which the Great Spirit made to you, whereby the small-pox, that fatal enemy of our tribe, may be driven from the earth. We have deposited your books in the hands of a man of skill whom our Great Father employs to attend us when sick or wounded. We shall not fail to teach our children to speak the name of Jenner and to thank the Great Spirit for the bestowing upon him so much wisdom and so much benevolence. We send with this a belt and string of Wampum in token of our acceptance of your precious gift, and we

beseech the Great Spirit to take care of you in this world, and in the land of spirits."

In the year 1842 the total number of Indians in the North-West was given as 3,040. This number was composed of 640 Blackfeet and 2,400 Assiniboines. John MacLean in his 'Canadian Savage Folk' says that they were reduced to 1,340 by small-pox.

There was a small-pox outbreak in Manitoba and the North-West Territories among the Indians in the fall of 1856. This was chiefly in the Wood Mountain District.

In 1862 eight or ten thousand white men entered British Columbia in quest of gold. This invasion was injurious to the Indians. These men came largely from California and brought with them small-pox, which rapidly spread among the Indians and perceptibly thinned their ranks. "The havoc played by the dread disease could scarcely be imagined by such as are not familiar with the absolute disregard of the Indians for the most elementary hygienc precautions in cases of sickness." The Rev. A. G. Monce, O.M.I., says that when he reached Victoria in July, 1880, he was assured by the priests that but a few years before the ground of the surrounding woods was still white with the blanched bones of the victims of small-pox.

The trail of small-pox, from the time it was introduced among the Montagnais in eastern Canada, until it reached the most westerly tribes in Canada, is one that is followed only too easily. It left behind it a broad and a well-blazed trail. One hundred years after small-pox had been introduced into Canada all of the tribes that roamed the Canadian plains from the eastern to the western limits of the country were infected.

The disease kept pace with, and at times outstripped, the progress of the white man. As to the number of deaths one can only hazard a guess. Suffice to say that it played no mean part in the reduction of the once numerous tribes that roamed the plains to a mere handful. Disease when introduced upon virgin soil usually causes great ravages, and this was well exemplified in the case of small-pox among the Indians.

Immunization Against Diphtheria With Diphtheria Toxoid—Anatoxine Ramon*

By Ruggles George, B.A., M.B., D.P.H.

The purpose of the work here described was to test the efficacy of diphtheria toxoid, a product manufactured by the Connaught Laboratories for immunization against diphtheria. This diphtheria toxoid is made according to the method of G. Ramon of the Pasteur Institute, Paris, whereby diphtheria toxin of high potency is treated with formalin and heat. This treatment gives an immunizing substance innocuous for guinea pigs even in doses of 5 c.c.

An opportunity for testing this product was presented at the Boys' Home, Toronto, through the coöperation of The Medical Officer of the Home, Dr. Allan Adams. This institution has about sixty inmates from five to fourteen years of age. The work here recorded was done on 53 of the boys who were expected to remain in the Home for at least six months from the commencement of the investigation. The average age of these boys was 9.1 years, and 36 of them were from eight to eleven years of age. Their medical records gave a history of diphtheria in ten boys, and eleven others were recorded as carriers during an outbreak of diphtheria in November, 1924.

Procedure

All of the boys were given a preliminary Schick test. The combined reactors and the older negative reactors were discarded from the group and the remainder given two doses of toxoid separated by an interval of three weeks. Three months after the second dose of toxoid the Schick test was repeated on the boys who had received toxoid and were still in the Home. Toxoid was given to some of the negative reactors, obviously not with the intention of conferring immunity, but to see if toxoid would stimulate a reaction in persons negative to the Schick test.

Preliminary Schick Test

The results of the preliminary Schick test were:

Positive	29
Combined	4
Negative	19
Pseudo	1
	53

That is, 33 of the 53 boys (or 62 per cent.) gave reactions indicating susceptibility to diphtheria.

*From Research Division, Connaught Laboratories and The Canadian Red Cross Society.

First Dose of Toxoid

When the preliminary Schick test was read, an injection of 0.5 c.c. of toxoid was given to 46 boys. None was given to the four combined reactors and three of the older negative reactors. Nine of the boys gave no reaction to this dose of toxoid, 33 gave a local reaction and four gave a general reaction. A "local reaction" meant that about 24 hours after injection the site was either sore or reddened, or both, and that there was no fever. A "general reaction" meant that the arm was sore and the temperature over 100.0 degrees.

To allay possible fears of the severity of the reaction to toxoid, it should be pointed out that a local reaction is more a matter of scientific interest than of practical importance. The number of local reactions in this group offers no discouragement to the use of toxoid, because in ordinary practice such reactions may be disregarded. None of the reactions, including the general reactions, were alarming or even severe. Two of the general reactors had temperatures of 101 degrees, one of 102 degrees and one of 102.4 degrees.

The average age of the 46 boys given the first dose of toxoid was nine years. The average age of the non-reactors was also nine years, of the 33 local reactors ten years and of the four general reactors 10¾ years. Although these groups are small for the use of averages, the comparison indicates that the older the boy, the greater the probability of reaction to toxoid.

There were nine boys with a history of diphtheria who were given toxoid. None of them gave a general reaction, six gave a local reaction and three gave no reaction.

Second Dose of Toxoid

A second dose of 0.5 c.c. of toxoid was given to 41 boys three weeks after the first dose. Seven boys gave no reaction, 29 a local reaction and five a general reaction. The temperatures of four of the general reactors were 101 or 102 degrees, and one of them had a temperature of 105 degrees. Two of the five general reactors to the second dose had also given a similar reaction to the first dose.

A comparison between the reaction to the first dose of toxoid and the reaction to the second dose was possible in 41 cases. This comparison is detailed as follows:

Reaction to first dose		Reaction 2nd dose		
		None	Local	General
None	7	4	3	0
Local	30	2	25	3
General	4	1	1	2
	41	7	29	5

This shows that six of the boys had more severe reactions with the second dose than they did with the first, and four boys had milder reactions to the second dose than they did with the first. None of the non-reactors to the first dose gave a general reaction to the second dose, and two of the general reactors to the first dose gave milder reactions to the second dose.

Subsequent Schick Test

Three months after the second dose of toxoid the Schick test was repeated on 36 boys who had received two doses of toxoid. The Schick readings were:

Positive	2
Combined	3
Negative	29
Pseudo	2
	36

Summary

As a result of this work, the boys may be grouped thus:

Considered previously immune to diphtheria	14
Considered as immunized by toxoid	20
Toxoid apparently failed to immunize	5
Toxoid not given because of combined Schick test	4
Discharged from Home uncompleted	10
	53

Conclusion

Toxoid appears to have immunized 20 out of a group of 25 susceptible boys; that is, 80 per cent. of the group. This may be considered a conservative estimate, for three of the five not considered as immunized were combined reactors, and a combined reaction is not a definite indication of susceptibility to diphtheria. This has been shown in some unpublished work of the Connaught Laboratories, in which the blood of some combined reactors contained more than one-thirtieth of a unit of antitoxin per c.c., an amount considered as sufficient to give protection against diphtheria.

Hieronymus Fracastorius de Contagionibus, Morbisque Contagiosis et Eorum Curatione, Libri Tres

Second Paper

By The Honourable William Renwick Riddell, LL.D., D.C.L., etc.,
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Fracastorius, having in his Second Book given a description of Syphilis, its causes and history, proceeds in the Third Book to discuss its treatment.

De curatione Syphilidis, seu Gallici Morbi

Cap. X

Now let us pass to the contagions which for the most part attack the exterior, beginning with the new disease, Syphilis. In the treatment of this (1), medical men have clearly disagreed, especially when it first made its appearance; for just as in its identification they remained without accord, so in its treatment, they were not of the same opinion. Some there were who considered adustion to be the cause of it, and consequently they administered medicines which were adverse to adustion—in this way not only not helping (2) but actually increasing the malady wonderfully.

Some thought it to be the same as Elephantia, and prescribed for its cure Viperated Wine and the flesh of the Viper (3); others enjoined quiet; others tried baths, also without effect; others, directing their attention to the pain, neglected all other treatment until moved by a certain empirical similitude of this disease with Scabies Fera (4), they for the first time ventured to treat it with Caustics (5). Many later on wrote more at length concerning the whole treatment, among whom we, ourselves, amused ourselves somewhat in three books to Petrus Bembus in Latin verse, when we were younger, and the City being attacked by a serious pestilence we retired to our own Caphi, where we were given much leisure for this matter (6).

Since, however, Poetry, as we have said above, does not permit or pursue everything, we had to omit much, which now when the treatment is to be set out, not poetically (7) but medically, may be worth while mentioning, especially as it is apparent that the treatment cannot be properly explained unless regard be had to the nature of contagions.

Whoever, then, aspires to treat this disease properly must in the first place turn his attention to the considerations following—first of all, whether the sickness is recent or of long standing, how far it has progressed and to what parts of the body, if it has occupied the nervous or the osseous parts—then if it is milder or severe, if of much materia or little and whether of the more recalcitrant or tractable (8)—whether it is wholly external or also internal, and if the ulcers are many, and whether there is more of pains than of pustules or the reverse, likewise, as to the gummosities—indeed in one word, all the differentia of this disease are to be kept before the eyes—particularly the analogy, for if it be to the phlegm, crass and sordid *per se,* as has been said, there is not one single consideration alone in respect of this phlegm.

Moreover, the universalia (9) are to be considered, age, sex, season of the year, temperament (10), and such matters—for all things do not agree alike with all persons.

Having carefully considered these, then be well assured that this disease when it has taken possession (11) of the bones is beyond hope unless by chance these bones can be burned (12)—consequently refuse to treat it or state in advance that the disease will return. That form is the more difficult to treat which is chronic and which depends on much and tough materia, which has many gummosities and has attacked a man of melancholic temperament (13).

The more severe remedies are to be applied in the more severe cases —to come down to particulars, in the first place, the air must not be impure or from the south—in fact, to avoid south wind, select a situation very northerly and cold. Then you must shun all leisure, all laziness, all inactivity; you must by every means and with all your might exercise, labor, sweat. This I say, this I advise, this I order, run, leap, hunt, exercise with gladiatorial ball-playing, wrestling—by this means you will liquefy, attenuate and expel the sluggish materia, and with it also the seminaria of contagion. But do all these in such a way as that when you stop you will not cool off suddenly and take a complete rest all at once, but pass over from fatigue to rest by degrees, cover yourself over with rugs, remain in a warm place—and indeed, I do not advise that this exercise should be taken in a cold place if it can be avoided.

In addition, the accustomed purgations of the body are to be brought about whether by the nostrils or the skin or the palate or *per alvum* and any others there may be, such as haemorroids, or menses, et cetera. Let nothing make its exit in excess, particularly of those secretions which are set free by venery (14)—do not give yourself up to too much wakefulness, nor let the sleep be excessive or taken during the day or immediately after dinner; do not be troubled with cares or

anxieties—let no studies occupy the intellect, no assiduous application of the mind.

The food is to be selected and prepared with great care, and I do not advise a restricted or a crapulous manner of living at first—speaking in general terms, there should be avoided everything putrescible, hard to digest, viscous, such things as are of poor nourishment, such as consume what is sweet in the blood—and for this reason, milk and eggs and fruit and all kinds of legumina and all fattened (15) meat, both swine and bovine flesh, and also fish and everything of that kind are to be avoided.

Since it is often necessary to use fish, the least harmful are Menae (15), Erythrini (which the Venetians call Arbores), Cuculi (which they call Lucernae), Scari, Percae, Merulae, Turdi, Aselli, Auratae, Phycides; also from the rivers and lakes what are called Temali and Strigili and Lucii and Cavacini and Barbuli and Sardellae and Carpii. Among Quadrupeds, discarding the feet, heads, livers and intestines, the following are proper—Haedi, Vituli, Hinuli, Lepusculi, and also Pulli gallinacei, Phasiani, both kinds of Perdix, that is both those commonly called by us Quaternix and those called Perdix, also Turdi and Merulae, Attagenes, Hortulani, Galeritae, Ficedulae and small wood-birds and the rest which it is impossible to name.

Do not let the wine be generous, but rather thin and white; and he who likes to use honey-water will not make a mistake.

Inasmuch as the analogy of this disease is, as we have said, to phlegm, crass and sordid *per se,* the intention (16) is particularly to be directed to that—in it are contained, too, the seminaria of contagion and part is infected, part is infected and also corrupt—consequently, as in other cases, it is necessary to turn the mind to these three things.

As to the seminaria, the cure may be made most quickly if you are called at the very beginning of the disease; sometimes this can be recognized, sometimes not. For there may be strong suspicion and apparently certain symptoms when one knows that he has been among infected persons and a kind of caries creeps in around the pudenda. These parts should then at once be laved with rosewater (aqua rosacea), then laved a second time and fomented with a decoction of alum and copper-verdigris, or all around the pubes should be anointed with the unguent which is ordinarily used in this disease and which we shall describe later; and also by the mouth should be taken one of those prophylactics which resist contagion, such as Theriaca or Mitridatum (16)—possibly by these means you will destroy and kill the seminaria of the disease, so that it will proceed no further.

If, however, you recognize that the disease is not about the first stages but that it has thrust its roots more deeply, and either pains or pustules or other indicia are present, you should have regard not only to the seminaria but at the same time to the materia which is partly infected and in danger and partly corrupt. The seminaria are never, however, to be considered of secondary importance, but always either to be killed (if that is possible) or to be drawn out. The materia which is corrupt should be drawn out, while that which is only infected is to be restored, or if there is much of it, to be drawn out. Whereas what is crass and sordid consisting in much lentor can neither be restored nor drawn out unless it is subtilized and so colliquated as that by it, it is possible to absterge all sordities and either to dry it up or convert it into sweat.

In reality, since everything is combined, as well the seminaria as the materia on account of the lentor, and moreover the pustules and pains and often the gummosities, too, it is to be seen to whether there is one plan and remedy to apply for everything and be effective for all the symptoms or whether more than one must be used—for there are those who try to cure everything by purgations alone, others by inunctions, others by fumigation (suffitus), others by those medicaments which convert materia into sweat (19), others again by those which resist contagion, others again use one help in one case and a different one in another—consequently it is apparent that all these must be carefully examined.

In the first place, then, let us begin with evacuation, which one thing some believe sufficient for every cure, and which certainly we have ourselves seen turn out well in some cases, but in some cases not to suffice. Let us premise that in every case of this disease the very first thing to be done is to digest and prepare the materia which is to be excreted—the medicines then should be hot (which are best fitted to this disease) attenuating, and as they say, incisory, inasmuch as the materia is viscid and sordid and oily (21). The best will be Oxymel and Rosated Honey and Syrup of Prassium, of Hyssop, of Betonica, of Calamenthus, of Epithymum, of Lupuli and the like to which is to be added Waters of Iris, Enuli, Epithymum, Agrimony-tops, Foeniculum, Apium, Pulegium, Origanum, Pimpinella, Carduus benedictus, Cicerbita, Chamaedrys—or have a decoction made of these and Scordium and Cretan Dictamnus and Thyme and Betonica and Schinanthus and Verbena and Syderite Heraclea and Amomum and Agalochus and such like (22). You may at the same time digest the materia by the following inunction or the like:

R/

Succi Rutae		
Succi Enulae	ana unc. j	
Theriacae	unc. ij	
Thuris	drac. ij	
Piperis	drac. j	
Axungiae		
Medullae Vituli		
Butyri recentis	ana unc. j	
Olei Chamaemelini		
O. Irini	quod sufficit	(23)

With this let the back, arms and thighs be anointed—it concocts the materia and alleviates the pain.

Then the materia so digested is to be evacuated, and that by Simples (24), which are especially effective; they are Colocynth and Hermodactyl and Hellebore and Agaricus and Aloes, with which are to be mixed those which at the same time dissolve and liquefy such as Serapium and Galbanum, Bdellium and Opoponox and Hammoniacum and Myrrh and Laser and such like. Of the usual Composites, (25) Aggregative Pills, Pills of Hermodactyl and Arthritic Pills and Indian Pills and Pills of Lapis Lazuli and Benedicta and the like, also Indian Electuary and that of Hamec and of Benedicta and the Theodoric and the Hiera Diacolocynthidos and the Hieras described by Scribonius and many others.

The primary evacuation made, those practitioners seem to me to act properly who effect a second concoction and a second purging—for we have seen cases in which on purgations properly effected, the patients were restored to health—there are some who administer the Syrups the second time, at the same time giving Solutives (26), adding to them either Senna or Agaric or Hermodactyl or powder of Hellebore either every day or alternate days—the latter I recommend.

If this manner of treatment alone is seen to be effective, we may omit all others; if, however, it is not successful, as indeed generally happens where either the disease is chronic or the materia very crass and tenacious—then it is necessary to try other remedies. Consequently we shall examine the rest of them. There are some who at once pass over to those inunctions which are made from Caustics; and this treatment was in vogue to the widest extent in earlier times—but I myself think those should be first tried very fully which are less caustic and of no danger, as some have frequently produced a happy result by exhibiting certain Aromatics after purging—these Aromatics not only

dry up and absterge, but also subtilize and strengthen—such as Calamus aromaticus, Macer, Agalochum, Casia, Zedoaria, Schinanthum, Iris and others, of which a decoction is most salutary. Others, again, have cured many with the wood of Juniper alone; others by Cupressus, others by Citrus alone, the shavings of which they use in the same way as those of Guaiacum, which is now to be treated of, as it is the most in use of all.

There was brought to us this tree from an Island of the New World called Hispania and the adjacent parts where this disease is most prevalent; the best is that from the Island called Beata.

There are many distinguishing characteristics not to be neglected—in the earliest times, great hard and very old trunks were brought in which there was too little white and much black; now as a rule there are brought branches recently cut in which there are seen much white and too little black—these latter are far more bitter and very styptic, the older kind rather sharp than bitter or styptic and very resinous—a great deal of the bark, too, used to be rejected in earlier times. Now this is taken at even a higher price than the rest of the wood.

Now this tree is seen to be in advance of all remedies which have been tried in this disease, for as it consists of the finest particles, they being hot in about the third degree (28) and dry, and as it is at the same time resinous, it is able to dry to the fullest extent in all modes, that is, by heat, by siccity *per se* and by imbibition (29)—it is able also to excite perspiration as well as to subtilize and liquefy the materia and absterge—and finally, in that it is resinous it resists in no slight degree putrefaction and contagion. It seems, too, to have a certain medicinal power, on account of which it is accustomed to move the bowels. Moreover, this is to be observed that the old wood, which is sharper, dissolves, liquefies and subtilizes more than the recent; consequently where the materia is crasser and the gummosities many, that is rather to be chosen. The recent, indeed, dries more by its siccity, which can by that very quality dry, less, however, than what is effected by heat—wherefore it dries less *simpliciter* (30), inasmuch as the effect which is produced by the dry quality itself is not very great in comparison with that produced by heat—but that strengthens more on account of its stypticity. And so where the constitution (31) is more delicate, and strengthening of the members is desired or the materia thinner, the recent is to be chosen.

Many, again, use the bark without distinction, inasmuch as it is drier; and, in fact, it is drier, but by that siccity which becomes dry by the dry quality and by imbibition, not that from heat—wherefore it

colliquates less and subtilizes less, it is dissolutive less and less sudorific —consequently the same is to be said of it as of the recent wood.

Moreover, a decoction made from the old wood is far more limpid and sharp, because by reason of the density of the wood it is less mixed with chips, but also has more sharpness because it is hotter. On the other hand, with the recent wood and the bark is admingled more chips, and consequently the water is more turbid and more bitter but less sharp. Such is the nature of the wood and the bark.

Then, too, there is less froth from that than from the old, inasmuch as in the old there is more of the black substance, in which there is more resin. Consequently I have often wondered why there has been such a change in the wood, and in what way the bark which used to be thrown away now has come to such a price, unless, indeed, it is the nature of physicians always to be introducing new medicines, by which means both more reputation and more lucre come to them (32)—the same desire for novelty changes the water in which it is boiled into wine—which again is used by many indiscriminately, not without great danger; for we have seen many, injuriously affected from drinking this wine, fall into incurable sickness. Consequently those who have warm and dry constitutions and weak habit of body, drier materia of disease, should beware of this drink; those, indeed, who are crass and humid, in whom the materia of disease is more sluggish, of greater lentor and more deepseated, with these it will not be useless to add that which brings out the virtue of the wood, which subtilizes and is agreeable to the members. For this reason many add honey, many, wine in a separate decoction, but afterwards mix them, as, decocted together, the product is too austere.

The wood is prepared in this way—the gratings (33) should be made with a rasp, not by contusion or cutting—one pound of powder in twelve pounds of water is to be infused for twenty-four hours in a pot of sixteen pound capacity—then to be decocted by a slow fire, the froth carefully collected and preserved for uses we shall state later, until it is reduced one half—this decoction is to be strained and kept —then there should be a second decoction, the remaining gratings being thrown into the same weight of water, but if of this is boiled away one quarter, it will suffice. The latter should be used as a wine, the former as a medicine.

There are some who add in the first decoction Senna, or Hermodactyls, or the like—others add these only after five or six days.

Of the first decoction are given seven or eight ounces in the morning to the patient in a warm place, which, you should insist, must not be drafty (34)—he is not to rise from his bed for three hours, but await

perspiration; five hours after drinking it, he is to breakfast—six hours after breakfast, he is to take another dose of the same decoction, five ounces if the patient can stand it, and four hours afterwards he is to dine.

In the earliest times, the patient never left his room for a whole month, but now greater licence is given. Moreover, at that time only so much food was given as would hardly sustain life—three ounces of bread or at most four, two ounces of chicken, one ounce of raisins; they rigidly abstained from wine, in the place of which they used the second decoction either by itself or with honey added. Now, however, everything is done more laxly, for they allow the patients to go from the house and eat more abundantly—in truth, however, those who undergo the severer treatment are more certainly and radically cured.

Some direct toast (35) to be given, by which, as I think, they certainly dry much; but this dryness does not seem to me to be the dryness we desire, for we desire not that dryness which comes from food insofar as it is food, but rather that which is produced for the sake of the humors as by medicine. Toast so far as it is food dries the members—which we do not want—and so far as it is medicine (since it is itself dry) and by quality and imbibition it can certainly dry, but this dryness does not pass over to the humors unless the blood made from the food is first dried. Consequently I have always thought this use superstitious, affected and of little advantage. The ulcers, if there are any, are to be bathed with the froth which you have collected, and all the callosities and the painful places.

Formerly thirty days were enough for this treatment, now more are needed, either because the materia has become crasser and more earthy than in the first times, or because we do not make use of old wood, and there is more licence given to the sick; but now twice the time is necessary for taking this drink.

NOTES

(1) The word is *curatio,* which properly means management, caring for, administration, etc. The cognate word *cura,* care, we still use in its etymological sense in the phrase, "Cure of souls," which does not mean healing of but care for souls.

(2) "Iuuantes" which we now print "juvantes".

(3) "vinum viperatum and viperae carnes." Vipers were a very favourite medicine in various forms.

The celebrated Moses Charas, (1618-1698), whose *Pharmacopoeia* first published in 1673 and improved in Mounier's edition, Lyons, 1753—(my copy is of this edition)—was translated into all the languages of Europe, and even by order of the Emperor of China into Chinese, not only devoted much space in that book to Vipers, but even wrote a whole volume on the subject. My copy is of the London translation of 1673; it is entitled:

New Experiments upon Vipers, with exquisite Remedies that may be drawn from them as well for the Cure of their Bitings as for that of other Maladies; also a Letter of Francisco Redi concerning some Objections . . . together with the Sequel of New Experiments upon Vipers in Reply to a Letter written by F. Redi, now rendered English.

An even more interesting book is that of Marcus Aurelius Severinus: *Vipera Pythia . . . De Natura Veneno Medicina Demonstrationes et Experimenta Nova*, Padua, 1651. These special treatises are too diffuse to quote—and I turn to Charas' practical treatise. In his *Pharmacopoeia*, in the Galenic Section, he treats of Oleum Viperinum according to the following prescription:

R/	Viperas viventes magnas, pingues & vividas,	xij
	Olei communis purissimi	lb. iij
	Vini albi generosi	unc. ij
	Extrahe oleum, s.a.	

Take 12 live, large, fat, shiny vipers, 3 lbs. of the purest olive oil and 2 ounces of generous white wine—extract the oil, *secundum artem.*

The directions are to pour the oil into a glazed earthen pot with a narrow mouth; heat it until too hot for a finger to bear; put in the vipers one by one, and when they are smothered, add the wine, cover the pot, and heat until the humidity of the vipers has about disappeared; cool and express. This oil is useful in all skin diseases, and specially for venereal ulcers.

In the Chymical Section, Charas devotes a whole chapter to Distillation of Vipers, Viperine Broth, Volatile Salt of Vipers, etc., with the same properties as the oil.

Even as late as Dr. Quincy's *Compleat English Dispensatory* (I quote from the 12th edition, London, 1749), the *London Pharmacopoeia* had formulae for Viper preparations. Of the flesh it is said, p. 140, "The general opinion at present is that they are highly restorative and that they provoke Venery." Formulae are given for Viper Bread, Viper Broth, Distilled Vipers, Viper Essence, Viper Oil, Compound Tincture of Vipers, Volatile Salt, etc. The investigations by the celebrated Dr. Mead of the Viper are well known to students of the history of Medicine.

(4) "Scabies Fera"—sometimes called "Scabies Vera," Ecthyma.

In Book II, Cap. XIV treats *Dê Leprâ propriâ dictâ et Scabie.* It is said: "Psora, which our people call Scabies, is a milder affliction than Lepra, itself passing over into Lepra as Lepra in Elephantia when the disease becomes more severe." At the close of Cap. XV, *De Distinctione Infectionum Cutanearum,* Fracastorius treats of the cause of Lepra and Scabies.

(5) Caustics. Celsus, the great authority on Medicine, gives a long list of Caustics, Medicamenta qui adurunt, in his *Dê Rê Medicâ,* lib. v, c.8, "auripigmentum, atramentum sutorium, chalcitis, misy, aerugo, calx, charta combusta, sal, squama aeris, faex combusta, myrrha, stercus et lacerti et columbae et palumbi et hirundinis, piper, &c., &c., &c.," winding up with ovillum stercus and oenanthe.

Dr. Quincy has only Quicklime, Cantharides, Spurge, Dittander, Gossipium, Moxa, Cow-itch, Soap and Spurge.

Those mentioned later by Fracastorius are Chalcanthus (Sulphate of Iron or Zinc), Arsenic, Corrosive Sublimate.

(6) Of course he is here alluding to his poem *Syphilide.*

(7) The word is printed "petice," a clear misprint for "poetice"—as, indeed, it is printed in the Venice edition of 1583.

(8) "&c si multae materiae est an paucae & an tenacis, an tractabilis magis."

The aetiology of disease must always be borne in mind in interpreting the author's meaning—he means here "whether the disease has already affected much or only little of the phlegm, whether it is of the stubborn or tractable character." All this, however, must at this stage be the merest conjecture.

(9) "Praeterea & alia universalia consideranda sunt."

Universalia—the plural of "universale," a post-Augustan word. The Schoolmen applied the term to general notions, such as genera and species. Here it means what is general and not peculiar to the patient.

(10) "Complexiones"—"complexio" is from "complector" and means a combination; here it means a particular combination of the humors and is the same as temperament, which means an admixture of the humors and by an extension of the idea the result of the result of the admixture—producing as it does a particular kind of disposition, sanguine, phlegmatic, choleric or melancholic, according as the blood, the phlegm, the yellow bile or the black bile predominates.

(11) "insedit" the perfect indicative of "insideo"—means "has occupied, taken or kept possession of"—like an army taking possession of a besieged town or citadel—the figure is a graphic one.

(12) This looks like humor, and rather sardonic. Fracastorius advises the doctor absolutely to refuse to treat a case where the bones are affected—or if he does treat it, to make It clear that a complete cure cannot be expected—the "clinical cure" was already known only too well.

(13) "melancholicum hominem tenet"—a man in whom the humor, melancholia and black bile, predominates.

(14) "pastica omnia"—"pasticus" meaning "fattened" appeared to have been used only once in ante-mediaeval Latin. Apicius Coelius, the writer on Cookery in the 3rd Century, A.D., speaks of "agnus pasticus," a fattened lamb.

In mediaeval medicine, the name "Pasticus" was sometimes applied to a kind of Morbilli and Variolae, called by others, "Ravallis."

(15) "Praesertim eorum quae per Venerem dissoluuntur"—the allusion is to the male and (assumed) female seminal fluids, set free by coition, the emission, mingling and concoction of which played so great a part in mediaeval theories of generation. The intention is to prohibit coitus, to which those affected by Syphilis were supposed to be strongly inclined. From other passages I gather that the author was of the same opinion as Sanctorius, who in his third Aphorism said that "coitus checks perspiration."

(16) These names will be explained below in the General Note. I pass them over for the moment.

(17) "intentio." "Intentio" in its primary meaning was exertion, effort, application; and only secondarily did it mean design, purpose, object. In medicine, it meant not only the object of the treatment but the treatment itself. In my student days, we had "healing by the first intention" (in those days of "laudable pus," less often seen than spoken of), *i.e.*, healing without suppuration on the first treatment; if suppuration supervened, as it generally did, we had "healing by the second intention," the second treatment.

In Cap. 2 of this Book, *De Intentione, quae habetur ad Principia,* Fracastorius says: "Having these things in mind, you will know that there are the three principal things to which every treatment (intentio) is to be directed. . . ."

(18) I.e., (1) the seminaria, (2) the infected phlegma not yet corrupt and (3) the infected and corrupt phlegma.

(19) "interim" is clearly a misprint for "interimi"—and so reads the Venice edition of 1583.

(20) Sudorifics are now generally called Diaphoretics.. Celsus has an imposing list: *op. cit.,* lib. V, c. 12. Quincy, *op. cit.,* p. 156, says that under this name of Diaphoretics are included what are understood by alexipharmics and febrifuges—he gives many herbs, flowers, seeds, gums, roots, cochineal, skinks, unicorn's horns, bezoar stone and eagle stone (found in an eagle's nest). This last was even supposed to have the power to influence the foetus *in utero*—at all events bound on the arm, it prevents abortion, and bound about the thigh it is ecbolic, assisting delivery, but if kept there too long it may draw out the uterus itself. *Cave!*

(21) "lenta," "lentus," is a difficult word to obtain the connotation of—it means pliant, flexible, but also tough and viscous, slow, sluggish, &c. Here it means viscid, so compacted as to be difficult to move and moving slowly.

(22) See Note 16, *ante.*

(23) I translate this Prescription.

Take of the Juice of Rue and Elecampane, each, 1 oz.; of Theriaca, 2 oz.; of Thus (olibanum or frankincense), 2 dr.; Pepper, 1 dr.; Lard, Calves' brain and fresh Butter, each, 1 oz.; oil of Camomile and oil of Iris, a sufficient quantity.

(24) "Simplicibus"—the "simples" of literature, generally herbs—and opposed to "compounds." Quincy, *op. cit.,* gives a list of the Simples in the London Dispensatory and the Edinburgh Dispensatory, not very different from each other.

(25) "Compositis" or "Compounds" not "Simples."

(26) "Solutiuos." Solutives or Laxatives.

(27) "Insula Beata"—Blessed Isle—not the Blessed Isle or Great Oasis of Egypt or the Canaries, the Isles of the Blest, but apparently some Island near Hayti.

(28) "iis calidis circa tertium gradum."

Heat and cold were graded into three degrees by the mediaeval schoolmen and scientists.

(29) "per caliditatem, per siccitatem per se et per imbibitionem." Every substance had some inherent quality, a quality *per se;* every drying substance had *siccitas, per se,* inherent siccity—then it was observed that heat dried up and consequently by its heat also a dry substance would dry—also by imbibition like blotting paper.

(30) "Simpliciter," i.e., *per se.*

(31) "Complexio"—temperamentum—see Note 10, *ante.*

(32) A nasty crack from a man who practised *gratis.* "Quare saepe miratus sum, cur tanta mutatio eius ligni sit facta & quomodo cortex, qui abijci solebat, nunc in tantum precium venerit nisi quod natura medicorum est noua semper inducere, per quae & plus authoritatis & plus lucri acquiritur"—I do not like that *plus lucri,* but so Fracastorius wrote it.

(33) "Scobes," means splinters, chips, dust, filings, gratings, &c., &c.,—here the scobes were made with a rasp or grater.

(34) "nec transpiret"—has no draft, no current of air. The word "transpiro" is not Classical Latin.

(35) "panem bicoctum"—the same as the French biscuit, twice cooked—but here toasted bread.

The Combining of Health and Accident Services by Industry

By Mr. A. R. White,

Chief Sanitary Inspector, Provincial Board of Health of Ontario

There is in Canada, and perhaps more particularly in the Province of Ontario at the present time, a feverish attempt being made by the forest product industries to find some avenue of escape from the intolerable burden of accident cost, which has now become of such serious proportions that many operators now claim fifty cents has been added to every thousand feet of sawn lumber, and approximately thirty cents to every cord of pulp wood cut.

The last ten years of history tells us that the cost of accidents has climbed steadily in spite of the best efforts industry has put forward. Therefore, unless we admit that the situation is without hope, we must seek some new explanation for the frequency of accidents and somehow try to propound a definite plan to better deal with severity, and from this thought I have drawn the idea and the title for my paper.

It has been my good fortune during the last ten years to supervise the public health arrangements and activities in connection with your industry in Ontario, and to create and develop an organization which, I hope, has demonstrated its usefulness in a most tangible manner so that it is now acceptable to industry and admitted to be an important cog in the industrial machine.

With this thought in mind then it seemed quite natural that your manufacturers should turn to this organization for such help and advice as might, at least, help out in the present dilemma, and instead of supporting an accident service and a health service, each separate from the other with the resultant double cost, that some effort might be made to fuse the two services in such a manner that we might the more quickly reach our objective.

It is not my idea in combining these services that the health organization should absorb such accident personnel as now exists, nor is it my idea that the accident prevention associations shall absorb the health machine. It is rather a merging of the two organizations for the benefit of all concerned that I seek, and why not? Are not both services seeking the same result, viz.—the prolongation of life, the greatest margin of

safety possible for the worker and the utmost economy of administration consistent with the highest possible service and a proper result.

At several meetings I have addressed recently in the interests of accident prevention, and at which I have tried to relate the effect of poor sanitary arrangements on the frequency of accidents, I have stressed three definite conditions:

1. Unsanitary conditions existing at your mill town or in the community where your men reside.
2. The presence of communicable or infectious (or preventable) disease in the household of your employee which produces that unsettled condition of mind that, while your workman is carrying on his usual occupation apparently, yet in reality his thoughts are at home where little Johnny is lying seriously ill with diphtheria.
3. Bad air conditions in your plants or in your wood cutting camps. Somehow or other very little attention seems to be paid to the question of ventilation, and as a consequence one often finds the worker, particularly in your machine rooms, labouring under conditions which are the reverse from confronting a draught of cold air around his feet and excessively hot air around his head so that he has a stuffed-up dazed feeling and consequently is not nearly so active or alive to the dangers about him.

Take the case of the man in your wood camps where there is no ventilation and no admission of fresh air during the night in an overcrowded camp, the continued breathing of air from which the oxygen has been used up by a red hot stove, and the carbon dioxide content raised by continued exhalation, and you have a very similar condition to the one just described in connection with your mill plant.

Let me cite still another condition which provides food for thought. History seems to have associated the woodsman with the body louse (Pediculosis Corporis). I am forced to admit that notwithstanding the many reforms introduced to bring safety from health hazards, to make life more livable to the lumberjack and to provide reasonable comfort, very little progress has been made in promoting personal hygiene among the men. I am therefore afraid that lousy men are still all too plentiful, and somehow men seem to become used and to some extent become immune to the attacks of these parasites. Take the case of the man, however, who comes to the woods for the first time and who has had no previous acquaintance with the body louse, but who becomes infected shortly after his arrival in camp, much of the time which should be spent in restful sleep is taken up in warding off the attacking pediculosis, for it must be remembered that lice feed usually at night when the person is at rest. What, then, can be the condition of this man after having

spent several nights in this fashion? Does he rise from his bed rested, refreshed and ready for a hard day's work? or is it not to be expected that he is stupid and inactive due to loss of sleep? If this latter condition should be correct is not this green woodsman, working with edge tools (namely, the axe, crosscut saw, etc.) not likely to become an accident case shortly after his arrival—or if he does not cut himself, the tree he is trying to fell may fall upon him and injure him fatally. And thus again we note an unsanitary condition which may very easily be the means of producing a serious accident, and a further argument for the linking up of your health and accident services.

In dealing with the prevention of accidents, as viewed by accident associations, much good work has already been accomplished, and some of the larger plants in Ontario and in Quebec, and I believe in the United States, have made very enviable records. Others, unfortunately, with the same facilities and opportunities, have fallen far short of what is believed to be a fair average accomplishment. Therefore, such gains as are made by the efficient accident personnel and the enthusiastic plant manager are very largely offset by the bad record plants.

It has often occurred to me that the offering of a cup or a shield or some other prize, to be competed for annually (such as is the case both in the United States and in some parts of Canada) is a thoroughly sound business practice. Competition in any business, as a matter of fact, cannot fail but to arouse interest, and we must have an interest in our subject before we can expect a better result.

It seems to me, however, that after we have gained possession of this cup or shield or whatever the prize may be, we are content, so that our efforts are realized, and we gradually sink back again into our former condition of mind, and accidents again begin to happen.

No doubt many of your engineers have been greatly discouraged when, after guarding every fly wheel, belt, gear and shaft that could possibly be guarded, then turned their attention to good plant housekeeping, and arranged for and organized safety squads for each shift, put placards up all around the mill so that apparently everything possible had been done that could be done, and yet accidents continue to happen oftentimes in regular epidemic form. Why is this? I sometimes think that too much stress is laid upon the placing of guards and too little upon a better understanding of the human machine. If we spent half as much time and thought upon the good health of the workman, even if he does not appear sick, and provided the best possible conditions under which he has to work, I am quite sure we would have less accidents.

I do not expect that accident cost will be reduced very materially by the reduction of accident frequency except in those mills which now have a bad record, and which can very easily be brought up to the same

standard as the mills with the good record, by the application of the same principles as already have produced a good result. I am rather inclined to believe that in the study of *severity* will be found the next large savings. The practice of sending your injured workmen to any one of ten physicians, should your plant be situated in a town or small city, should be stopped. How can you expect any of these ten curative physicians to be interested in shortening the period of disability, since in so doing the treatment fee would also be reduced. Such an arrangement is quite impossible if lessening the severity of cases is the end you seek.

Your accident cases should be sent to one physician who should be arranged with to take a special interest in your cases, and to having the injured employee back to work at the first possible moment (consistent with good medical practice). The same physician should also oversee your first aid facilities whether you utilize the services of a nurse or use trained employees. An attempt should be made by him to assist your safety department to locate special hazards, other than those which may be cited as *environmental*. In short, there are a hundred different ways in which the doctor who would exclusively deal with your injured men could help in reducing accident cost if he is chosen wisely.

The great savings in accident cost, however, as I see it, are not to be made so much in connection with your mills as in the wood camp from whence your supply of pulp wood is derived. It really does not make any difference whether the wood is cut by your company, upon your own timber limits or is purchased from some timber contractor, you still are required to pay the accident cost which is charged in the cordage price.

In Canada, at least, whatever may be the case in the United States, the accident losses each winter are appalling. Take the general lumbering concerns of Ontario for example—during the year 1924 there were 32,000 men employed in the timber camps, 44 were killed; 3,423 injured and it cost the industry $1,000,000 to pay the shot. Add to this the permanent disability cases, which are legion, and try to imagine the number of fingers, toes, hands, arms and feet that have been amputated, and you will still find a sufficient excuse for the classical statement made by Juhnke "That cripples and helpless wrecks are still a by-product of certain industries".

Ten per cent. of the men employed in the wood camps, whether engaged in the cutting of pine logs or pulp wood, are *injured* each year.

Realizing that this situation required some drastic remedy, the Lumbermen's Association of Ontario retained the writer to look into the situation, and see if something could not be done to check this appalling loss in man-power and in dollars.

A short investigation with the facilities at our disposal showed that the great preponderance of accident cases were *axe cuts and saw cuts*, and that, with proper care, few of these cases should have gone to compensation had not infection set in due to lack of first aid. Thus the disability was at least quadrupled, not to speak of the hand or foot, and in some cases, the arm or leg having to be taken off to save the life of the woodsman. Investigation of the accident cases of thirty companies disclosed a rather interesting and somewhat startling fact, which should go far towards explaining the high accident cost charged against your wood before it enters the mills, in connection with the thirty companies which I have already mentioned. There were approximately 500 open wounds during the season's work. *Sixty per cent. of these wounds* were infected when first seen by the doctor, so that primary suture (or the sewing up of the wound) was impossible.

Now at this point I wish to make sure that those facts which I am recording are being thoroughly understood and their economical significance fully noted. The temporary disability in each of these cases was extended four or five times what it normally should have been, so that these accidents cost just five times as much money and five times as much pain and suffering as was necessary; and in addition, without doubt, there would be among the 500 cases of infection a number of permanently disabled men which the industry must continue to support and pay for as long as they live. Surely it may be seen at a glance if our business as safety organizations is to prevent accidents if we can; but if accidents should happen, and they will, then strive to reduce the extent of the disability and thereby reduce cost. There is no surer or quicker way to approach your ideal than to plan to properly deal with *infection of wounds* both in your paper mills and in your woods camps—for, let me repeat again, it matters little whether you cut your own wood or purchase your supply from contractors, you must still pay this awful accident cost. I see no escape unless the issue is squarely faced.

Now I feel quite certain you may consider I have strayed from my subject, and that you may, for the moment, be vastly more interested in a good accident record at your mills; but can you afford to pass up, or side step, the opportunity to reduce accident cost in your logging camps when you are now aware that failure to deal with the question is penalizing your mill manager by adding thirty cents to each cord of pulp wood he purchases.

Assuming, therefore, that you are vitally interested in all phases of accident cost which affect the well-being of the pulp and paper industry, I would offer the following plan which I am sure will be found effective, and which will, I am quite certain, be adopted by the forest product industries in Ontario and perhaps in some of the other provinces as well.

1st. The establishment of first aid facilities at every camp, irrespective of size, or the number of men employed.

2nd. The industrial physician associated with each company is to agree to teach the *camp clerk* the practice of first aid to the injured (with special emphasis upon the proper sterilization of open wounds), the splinting of broken bones, and the proper methods to use in stopping excessive blood flow and resuscitation. He shall also teach, by practical demonstration, the kind of cases which may be treated in camp and those which should immediately be sent out for hospital treatment. I am stressing this last item particularly, as I find that there are a great number of cases sent to the hospital which could be better dealt with at a camp and the man remain at light work.

3rd. The foreman in each camp is to be responsible for directing the injured man to the first aid officer as soon after the accident as possible, and shall further fix, or attempt to fix, responsibility for the accident.

4th. The woods boss or manager is to oversee the work of both first aid officer and foreman, and is to report to the accident engineer or to the Association, any failure on the part of this machine to function at 100 per cent. efficiency. Steps will then be taken to probe the situation and apply a proper remedy. The clerk who, under this plan, is also to be the first aid officer as you will note, is to be subject to discipline in the same manner for failure to perform his new duties as if he neglected his regular work of bookkeeping or other duties.

5th. The industrial physician who enters into a contract annually with the company is to agree to take an interest in accident prevention, and is further to do all in his power to hasten the return to work of all men who may be injured, consistent with good service.

On the other hand, the company is to agree to provide light work for such men as may be returned to camp by the doctor, but who are not yet strong enough to carry on the same work as before being injured. I find that men, who have completely recovered from injury, but who are not yet as strong as before, are allowed to remain hospital patients for a considerable period after complete healing of the wound. The cost of such practice in Ontario is $3.00 per hospital day, plus the doctor's fee, and in addition 66 2/3 cents compensation is paid to the injured man, or $5.50 per day; whereas if the man is returned to camp and light work, provided no further cost to the industry will accrue, the man himself will be better off earning 100 per cent. of his wages, and will recover his normal condition much more rapidly by reason of the light exercise. But even assuming that the injured man does not commence work immediately after his return, you will have saved your hospital cost,

your doctor's fee and the man's compensation allowance, without imposing any hardship or injustice upon any one by the application of good business practice.

I hope these few definite thoughts on the combining of health and accident services may, at least, serve as the basis for a good discussion. There is much to be said on this great question and many angles that might be taken up and thrashed out to the industry's benefit. For the present, however, I see great possibilities in merging the health and the accident organizations since, while each works separately, I see no reason why this should continue; and in these days of rigid economy do not let us forget there is much sound economics at least suggested in the title of my paper.

Radio Talk

Mental Disease in Relation to Crime

DR. C. B. FARRAR,

Director, Toronto Psychiatric Hospital

Radio talk arranged by the Canadian Social Hygiene Council and delivered for CKCL, Toronto, January 5, 1926

As the subject for discussion I have chosen that of mental disease in its relation to crime. Assuredly we have enough of both in our present day civilization to make such a discussion at least timely.

The popular attitude toward these matters, and the professional attitude as well, have undergone very striking and interesting changes during the past 100 years. It was somewhat over a hundred years ago that on the Continent of Europe and in England remarkable reforms were taking place in the management and treatment of persons suffering from mental disturbances. Methods hitherto in vogue had been largely those of neglect, and, when a victim of mental disease was placed in confinement, it was solely with a view to the public welfare, and not with any idea of treatment and restoration of the deranged person. The question of illness did not enter at all; and over the portals of the cells where such unfortunates were confined might well have been written the classic warning "All hope abandon ye who enter here."

It goes without saying that the mildest and earliest manifestations of nervous disorder did not, in those days, attract the attention they now receive as warnings and danger signals, pointing to the necessity of treatment before it is too late. Such mild, and, to use a term which has been handed down from cruder times, "harmless cases" had not yet become a social and medical problem. The first and all important question was: Is the sufferer harmless? If so, society did not need to concern itself. The deranged person might roam at will, until he became a public nuisance or an obvious menace to society. It followed that those mental patients, who were placed in custody, were the extreme cases, those whose malady had rendered them no longer fit for social relationships, and they were accordingly segregated from society.

But there was another class of individuals, also segregated from society for the good of society, namely, convicted criminals.

The two classes, criminals and insane, were therefore incarcerated for the same purpose, and for that one purpose only—the Public Safety; and so long as this idea prevailed there were no compelling reasons for handling the two classes differently. And they were not handled differently. They were housed together and treated alike, and the pattern of treatment was that which might have been thought fit for the criminal rather than that suitable for a person suffering from disease.

Even George III, during his recurrent attacks of mental disease, was not only shorn of his kingly authority, but committed to the charge of keepers who, as we learn from trustworthy contemporary records, indulged in the same brutal methods, that were customary during the 18th century, in dealing with mentally deranged persons.

The word "insane" was used a moment ago for the first and only time in this talk, except as a legal term; and it was then used purposely on account of its connection with old time ideas. In law the word insane refers to a state of irresponsibility by reason of mental derangement of such severity that the sufferer may be certified as "insane" and deprived of his liberty. From the medical point of view the word insanity, not being susceptible of definition, is really without meaning; for mental disorder is a matter not only of kind but of degree, and irresponsibility, likewise, is purely a relative affair. In popular usage "insanity" is a convenient but much abused term; in law, it has been given a definite meaning; but in medicine, it has quite properly fallen into disuse.

By the close of the 18th and the beginning of the 19th centuries new ideas with regard to mental derangement were making themselves felt, notably from the inspiration of two great physicians, Pinel in France and Tuke in England.

The new viewpoint looked upon the mentally unsound as sick persons; and the effect of this new viewpoint was twofold; first, to remove from mental patients their shackles and chains and separate them from their criminal associates; second, to build hospitals where not only the victims of mind illness might be safeguarded, but where humanitarian methods of treatment could be worked out.

From that parting of the ways of a hundred years ago we have much to learn. It was natural that philanthropic attention should first centre upon those social misfits who were more obviously the victims of disease, and that at first it should centre upon them exclusively, to the neglect of the other group, namely, the criminal class. In the popular mind, and in the attitude of Social and State Agencies, therefore, a line of demarcation between mental diseases, as such, and criminality, as such, was more and more sharply drawn.

On the one side were the persons who, to all appearances, chose to do wrong, and who must therefore be punished; on the other, were the victims of illness who deserved the best that medical science could offer.

Unquestionably the growth of this principle has been a tremendous advance in the right direction, in so far as the victims of illness are concerned; but does it tell the whole story of the criminal? To be sure, we have had, all along, criminal cases in which mental incompetency has been established, and in which offenders have thereby escaped the penalty of their crimes; but the "insanity dodge," as it is so often sarcastically called, carries with it the sinister implication of a trick to defeat the ends of justice.

We are between the two horns of a dilemma. Is the man or woman, who has performed a criminal act, merely a deliberately vicious person who must be punished, or is the criminal act the result of impaired responsibility, owing to some mental infirmity, which requires treatment rather than punishment? These are the extreme positions and the truth must lie somewhere between. The fact that there is so much difference of opinion in these matters is evidence of the backward state of the science of criminology. During the hundred years that mental medicine has been steadily advancing, the study of crime has lagged sadly behind.

Recently Chief Justice Taft, of the U.S. Supreme Court, remarked that "the administration of criminal law in the United States is a disgrace to civilization." This remark referred particularly to the fact that among civilized nations the United States holds the record for crimes of violence, and that it is common, in that country, for murderers to go unpunished. But there is more to do with the criminal than merely to punish him, and in the scientific conception of crime as a social disease, in which the medical and psychological investigation of the individual delinquent is the indispensable condition, striking advances have been made in several American centres, notably Chicago and Boston.

It is nevertheless true that, in comparison with other biological and sociological sciences, criminology has been extraordinarily retrogade. The reason is not far to seek. The criminal is an offender against society. His acts do harm to other human beings, either in their persons, their property, or in their social and economic relations; and this harm has all the external appearances of being intentional. It arouses, at once, not only in the injured person, but in the community, a strong feeling of indignation, which calls for vengeance. This desire for vengeance is a primitive reaction which humanity shares with the rest of the animal creation. We may elevate the indignation by calling it righteous indignation, and we may assert that penalties are devised to discourage repetition

of criminal acts, and to deter others from committing crime; and yet we are painfully conscious that punishment serves neither of these purposes. This is a fact which we have to face, no matter how much it wounds our pride as a civilized people, by showing us that our method of dealing with crime is largely a failure.

Disguise it as we may, the sense of indignation and the desire for reprisal have been the basis of all systems of punishment from the time of the old law of an eye for an eye and a tooth for a tooth down to the highly differentiated penalties of to-day.

This we are persuaded is the reason why it has been so difficult to consider dispassionately the question of crime, and especially the question of the individual criminal. Let us say that a particularly atrocious crime has been committed in the community, like the recent case of Noel, the youthful insane slayer, in New Jersey. "Feeling runs high," as the newspapers delight to put it. That feeling which dominates the community permeates the courtroom, it takes possession of the jury, possibly even it does not leave the judge untouched. The influence of this mob-feeling is paramount. In public opinion two questions force themselves to the front. Did the accused commit the crime? What punishment should he be made to suffer? And there are doubtless many who feel that the sentence of death, pronounced against the New Jersey murderer, is the proper solution of the matter in spite of the fact that he had recently escaped from a State Institution for Insane, and was suffering from a well-recognized and probably permanent form of mental disease. We may submit, however, that the legal killing of a mentally deranged murderer is not advancing the science of criminology. Whether or not it is the best way for society to safeguard itself against an irresponsible and dangerous person is another question.

But we must interest ourselves in the criminal as an individual, not merely in the anti-social acts which he commits. Criminal acts have causes; the everyday acts of the normal man have causes; the extravagant acts of the mental patient have causes. Here are three varieties of conduct, and yet experience shows that the springs of action in all three obey the same fundamental laws.

The chasm which philanthropy constructed between criminal types and mental cases and, we may add, between these two types on the one side, and so-called normal man on the other, has been made unduly wide. This can be said without any unfavourable reflection on either side.

Let us consider one or two facts. Statistics of all penal institutions, in which reliable surveys have been made, show that an overwhelming majority of the prisoners are mentally abnormal persons. This observation an intelligent layman, passing through a prison or penitentiary,

would probably have no difficulty in making. A very painstaking study recently completed in all the County Jails and penitentiaries in the State of New York, 34 in number, revealed the fact that 77% of all the inmates were individuals with well-pronounced types of mental disorder. Another very striking fact was this, that exactly two-thirds of the prisoners were repeaters, their previous arrests numbering from one to more than fifty. Moreover, among the confirmed repeaters mental disorder was found in a much higher percentage.

Studies such as this have been made, from time to time, in other parts of the country, and they all tell the same story, namely, that the majority of convicted criminals are victims of mental disability of one type or another, which correspondingly affects their conduct and implies an impairment of responsibility.

Can we draw a corresponding lesson from the study of groups of avowed mental patients, such, for example, as may be found in any Psychiatric Hospital?

It is a matter of everyday experience in such institutions that many patients reveal propensities and, not infrequently, perform acts which in normal individuals would be regarded as criminal. In the hospital they are not considered in that light, however, because the patients concerned are so clearly ill and unaccountable.

The most important study of Mankind is Man, not only in his normal state, but particularly in all his abnormal and anti-social reactions. Criminology is simply a department of the science of human conduct. It can not be built up merely by cataloguing crimes and attaching penalties —so much penalty for so much crime—and then assuming that the matter is settled and society squared. It must be built up by the study of the individual delinquent upon precisely the same lines that the individual mental case is studied. In the criminal act, and in the symptoms of disease alike, we have the effects. These are patent. Anyone can observe them. What we require to know in every case is the cause of the abnormal conduct. Only so can we rationally conduct the treatment of the mental patient, only so can we deal with the still more serious problem of the proper handling of the criminal.

From all parts of the country come reports of the increase in the incidence of crime, and commissions are considering ways and means of stemming the tide of lawlessness.

To define crime, as to define insanity, is a difficult thing, for both are relative. One aspect, however, they have in common, they are both social diseases; and the proper treatment of disease presupposes a knowledge of the nature of the disease, a thorough-going diagnosis. The social disease called crime, like any disease, can be treated in no other way. Criminal diagnosis does not mean naming of crimes, putting tags

on them, labelling them arson, larceny, assault, murder, and so forth. These are only symptoms, effects, not causes, and it is the causes which must be investigated.

Fortunately, the experience and knowledge we already possess point the way in such investigations. Those perpetrating anti-social acts, of such seriousness as to merit the attention of the authorities, are properly deprived of liberty and segregated from society. There is no argument about the necessity for this step. But where shall they be segregated? We have only prisons. Prisons are places of confinement; but what is necessary is not only confinement but the scientific study of the individual confined. Such study must include the most thorough possible medical, sociological, and psychiatric investigation of the case, as well as all of the legal aspects; and the disposal of the case should be based on the combined findings of this investigation.

For the purpose of such study the human individual may be looked upon as a reacting mechanism. He has been launched into existence with a certain inherent capacity, determined by heredity, for meeting the demands of life. This inborn capacity he can not exceed. It is fixed and immutable. With such native endowment as he has his problem becomes, therefore, one of adaptation to the circumstances in which, through the successive years of his life, he finds himself.

Moral values in the ordinary sense have not much application here. The question is primarily one of mechanistic adjustment. How is the human machine working? How is the human unit fitting into the social body?

These questions are answered in the conduct or behaviour of the individual; and abnormal and anti-social conduct is in itself presumptive evidence of deficiency or abnormality in the reacting mechanism, in other words, of mental deviation of some type or degree.

A sufficient period of observation and the necessary examination will determine in a given case whether such assumed deviation from the normal actually exists; and, if so, further indications in the case should not be difficult to determine.

Only in the small percentage of criminal cases, in which mental abnormality can not be demonstrated, are we justified in saying that the question should be one of punishment, pure and simple. In such cases, making due allowance for extenuating circumstances, it seems clear that penalties should be definite and precise, with nothing indeterminate about them, of sufficient severity to answer the seriousness of the crime, and absolutely untainted with sentimentalism, in any form.

There are two further points about which a word must be said, namely, the question of parole and the disposal of repeaters.

In a recent conference of jurists and criminologists in New York State the remark was made that "The most useless body in the State of New York is the Parole Board". This remark gives us very serious food for thought in this province.

Knowing as we do that the majority of all criminals are of impaired responsibility, and also that the majority of criminals are repeaters, there can be no doubt that the parole of a prisoner, without a thorough knowledge of his case and of his mentality, based upon such investigations as has been referred to, and which will at least warrant a reasonable conclusion as to what his future conduct is likely to be, is nothing less than mischievous and subversive both of justice and of the welfare of society.

The question of recidivism (repeaters) is one of the most serious in the whole subject of crime. The average criminal, being also a mental invalid, gravitates most naturally into a life of habitual crime. It is not only somewhat absurd, but often specifically dangerous to allow such individuals to be at large at all; and it is a serious indictment of our penal system, that persons of this kind should be apprehended time after time, imprisoned for a period deemed suitable for the individual offence and turned loose on society again when adequate examination would almost certainly foretell that the same story will be repeated.

There is a large class of repeaters with dangerous tendencies, for whom permanent custody is the only means of properly safeguarding society.

In this brief discussion it has been necessary to indicate points of view briefly and more or less arbitrarily. Detailed elaboration is not permitted by our time limit. The points here raised, however, will I believe indicate the need for thinking over these problems, and working toward further steps in their solution than it has hitherto been possible to take.

The Provincial Board of Health of Ontario

Communicable Diseases reported for the Province for the Weeks ending December 5th, 12th, 19th, 26th, 1925

COMPARATIVE TABLE

	1926		1925	
Diseases	Cases	Deaths	Cases	Deaths
Cerebro Spinal Meningitis	6	2	1	1
Chancroid	—	—	11	—
Chickenpox	1010	—	971	—
Diphtheria	288	16	318	25
Encephalitis	2	—	5	3
Gonorrhoea	135	—	142	—
Influenza	—	46	20	6
German Measles	63	—	21	—
Measles	1305	3	1222	7
Mumps	566	—	627	—
Pneumonia	—	281	—	218
Poliomyelitis	2	1	—	—
Scarlet Fever	811	7	870	13
Septic Sore Throat	8	—	14	1
Smallpox	80	—	50	—
Syphilis	114	—	113	—
Tuberculosis	138	82	172	89
Typhoid	51	4	38	5
Whooping Cough	240	3	181	6

The following municipalities reported cases of smallpox: Toronto, 23; Ottawa, 3; Kitchener, 3; Brantford, 1; Belleville, 2; Guelph, 1. Hastings, V, 5; Trenton, 7; Eganville, 1; Griffith and M. Twp., 1; Ameliasburg Twp., 6; Waterloo Twp., 6; Waterloo Town, 1; York Twp., 2; Alice and Fraser Twp., 2; Scarboro Twp., 1; Admaston Twp., 11; Hillier Twp., 1; Port McNichol, 1; Atikokan, 2.

JOHN W. S. MCCULLOUGH

Notes on Current Literature

From the Health Information Service, Canadian Red Cross Society, 410 Sherbourne St., Toronto 5. Readers of the "Public Health Journal" may borrow any of the articles listed. Please mention the date of issue of this Journal and the title of the article desired.

Health Propaganda

Ways, means and costs of health propaganda by local authorities. By Dr. W. A. Daley, Medical Officer of Health, Kingston-upon-Hill, England. "National Health", Dec. 1925, page 198.

The History of Public Health Nursing

A brief review of the history of Public Health Nursing in the United States. "Public Health Reports", November 6, 1925, page 2471.

Generalized Public Health Nursing

By F. H. M. Emory, Chairman, Public Health Section, Canadian Nurses' Association. "Public Health Journal", November 1925, page 509.

American Child Health Association

The report of the American Child Health Association for 1925 summarizes the activities of this organization in advancing the cause of child health.

Mental Hygiene and the Nurse

By Dr. Douglas A. Thom, Director of Mental Hygiene, Massachusetts Department of Mental Diseases. "The Public Health Nurse", November 1925, page 549.

Milk Control

The importance of milk control in dairies. "Nation's Health", December 1925, page 818.

The Campaign against Venereal Diseases in Great Britain

By Mrs. Neville Rolfe, Secretary General of the British Social Hygiene Council. "The World's Health", November 1925, page 454.

Results of 6,600 Shick Tests in California

By Frank L. Kelly, M.D., Ida May Stevens, M.A., and Margaret Beattie, M.A. "Public Health Reports", U.S.P.H.S., December 4, 1925.

Education for Public Health Nursing in the United States

By Gertrude E. Hodgman, Assistant Professor of Nursing at the Yale School, Educational Secretary, National Organization for Public Health Nursing. "The World's Health", November 1925, page 467.

Eye Hazards in Industry

A popular article by Louis Resnick "Hygeia", December 1925, page 667.

News Notes

Dr. Heagerty, whose article "Smallpox Among the Indians of Canada" appears in this number, has been engaged for the past two years in the preparation of a Medical History of Canada. The articles published and lectures given by Dr. Heagerty would indicate that the Medical History of Canada is replete with interest and striking incident. The Romance of Medicine in Canada would appear to be more descriptive of the material that has so far been presented. The records have been wonderfully well preserved, and Dr. Heagerty is to be congratulated in undertaking so important a piece of work as their collection and publication. We are looking forward to the publication of further material along the lines of the article presented in this number.

The Department of Public Health of Saskatchewan, under the direction of Honourable Dr. Uhric, Minister of Public Health, has had plans prepared for a hospital at Ile-à-la-Cross, in the northwestern part of Saskatchewan, and at the same time to subsidize a medical man to reside there. This is to be accomplished through the co-operation of the Federal Government with the Government of Saskatchewan.

The first meeting of the Board of Honorary Advisory Directors of the Canadian Social Hygiene Council was held in Montreal on Thursday, February 4th, 1926. Those present were: Mr. L. M. Wood, Mr. J. P. Bickell and Dr. Gordon Bates of Toronto; Hon. Frank Carrel of Quebec; Dr. C. F. Crutchlow, Montreal, representing Mr. H. C. Cox and Mr. T. G. McConkey of the Canada Life Assurance Co., Sir Frederick Williams-Taylor, Mr. J. W. Ross of Montreal; and Mr. J. A. Machado and Mr. A. F. C. Fiske of Ottawa.

The Board discussed the general principle to be followed in financing the Canadian Social Hygiene Council throughout Canada, and also considered the general policies now being carried out and those planned for the future. It is expected that this Board, which is composed of some of the most well-known financial men in Canada, will be of great service in furthering the plans of the Social Hygiene Council for extending health work in Canada.

The First American Health Congress

For the first time in the history of public health in America those who are doing the work itself will have a chance to meet together and view it as a whole when the American Health Congress convenes in Atlantic City, May 17-22. This Congress has been the dream of the National Health Council, 370 Seventh Avenue, New York City, since its formation in 1921, and will reveal the vast strides in co-ordination of effort and co-operation that the Council has brought about for its member organizations during the last five years.

Included in the membership and on the staffs of these participating organizations are the leading authorities of the country in every phase of public health—tuberculosis and cancer control, prevention of blindness, social and mental hygiene, public health nursing, the control of preventable diseases, the study and care of heart disease, and positive health education for both children and adults. This means that the programmes will not only show the accomplishments of public health workers up to the present, but will also forecast the plans for the future. It is possible that a public health programme for a decade may result from the meeting of specialists in so many fields.

To address the opening session of the American Health Congress, Sir Arthur Newsholme, who has been highly influential in the development of public health work in England, and who also has a close knowledge of the American public health situation, is visiting this country. Professor C. E. A. Winslow, President of the American Public Health Association, will address one of the general sessions of the Congress. "Is Public Health Improving the Race" is the piquant title of the address to be delivered by Dr. Ray Lyman Wilbur, President of Stanford University. It is especially fortunate that this American Health Congress will hear of the international phases of health work from Dr. George E. Vincent, President of the Rockefeller Foundation. Many other renowned speakers will complete the well-arranged programme.

Meeting at the same time, in Atlantic City, the three national nursing organizations—the American Nurses' Association, the National League of Nursing Education, and the National Organization of Public Health Nursing, will hold their biennial convention; the American Child Health Association and the Conference of State and Provincial Health Authorities of North America, will gather at this time for their annual meetings. The member organizations taking part are: American Child Health Association; American Heart Association; American

Public Health Association; American Red Cross; American Social Hygiene Association; American Society for the Control of Cancer; Conference of State and Provincial Health Authorities of North America; National Committee for Mental Hygiene; National Committee for the Prevention of Blindness; National Organization for Public Health Nursing; National Tuberculosis Association; United States Children's Bureau; United States Public Health Service; Women's Foundation for Health. This means that the field of public health is completely covered in the general and special sessions. It is of special interest that the General Federation of Women's Clubs will hold its meeting immediately following the American Health Congress.

Exhibit space has already been taken by commercial and non-commercial groups, forming one of the most educational health displays that this country has ever seen.

Special railroad rates from all parts of the country have been secured, and already the assurance is that there will be at least 7,000 in attendance.

Annual Meeting of the National Committee for the Prevention of Blindness, November 30 to December 5, 1925

The Annual Meeting of the National Committee for the Prevention of Blindness was held in New York City, from the 30th of November to the 5th day of December, inclusive. The programme was divided into several sections. The first section of the opening day was organized as an Institute for Volunteer Workers, under the chairmanship of Miss Eleanor P. Brown. On the afternoon of the opening day a special programme featured the Pre-school Eye Clinic, Dr. Weidler presiding with Dr. Skeel as speaker; and a joint session was held with the American Museum of Safety. At the latter session the speakers were Arthur Williams of the New York Edison Company, Harry Guilbert of the Pullman Company, Preston Millar of the Electrical Testing Laboratories, and a general Round Table on Eye Hazards was held, in which many safety and illuminating engineers took part.

The Tuesday programme dealt with that part of prevention that commissions and associations may do, and had to do largely with co-operative procedures. Mr. Lewis H. Carris, Managing Director of the National Committee, presided, with H. R. Latimer of the Pennsylvania Association for the Blind, and Mrs. Harris of the Missouri Commission, as morning speakers. In the afternoon Miss Hayes of the New Jersey State Commission, Dr. Royer, Medical Director of the National Committee, and Mr. Irwin of the American Foundation for the Blind, made addresses, at the conclusion of which a special demonstration was given by teachers of sight-saving classes in the city of New York. Dr. Blumenthal of the New York City Department of Health, presented a statistical paper on sight conservation. Reading lessons were demonstrated, with a class of visually handicapped children on the stage, by Miss Helbling of New York City. A principal's viewpoints were given by Dr. Peyser. Miss Clark illustrated the use of pictures in sight conservation classes. Miss Caldwell discussed social adjustment of the partially sighted, and Miss Farrell classification of pupils.

Wednesday's programme dealt with trachoma among the Indians. Dr. Lanza of the National Health Council presided. Dr. Spinden of Peabody Museum, Harvard, discussed the subject from a social and economic standpoint, Mr. Carris gave facts and figures, while the Hon. Chas. H. Burke, Commissioner of Indian Affairs, gave at length what

the Bureau has accomplished. An open discussion by visiting ophthalmologists, showed what needed to be done to eliminate the disease. Miss Janowich told of training Indian girls for tribal nursing service, while Miss McKittrick related observations with Pueblo Indians.

At the Annual Directors' Meeting, Dr. William H. Wilmer, Director of the William Holland Wilmer Foundation, Hopkins University, pointed out that activities carried on during the life history of the National Committee were responsible for cutting down the birth infections causing blindness some 50 per cent., but that more needs to be done. He confirmed the figures presented in the special session on trachoma, and pointed out its menace to America and to many parts of the world. Dr. Lewis, 1st Vice-president, presided at this meeting.

Interest was aroused in Friday's section of the programme dealing with sight-saving classes, Mrs. Winifred Hathaway presiding, where Miss Lawes of Cincinnati, Dr. Ide of Philadelphia, Miss Ridgeway of Massachusetts, Mrs. Hadley of Ohio, Miss Stillson of Wisconsin and others discussed technique, psychology and management of details. A round table discussion later in the day, opened by Dr. Pratt, considered the advantage of specialists in sight-saving services in schools, while the Managing Director discussed legislation needed and methods for securing it.

On Saturday morning the members and guests studied a pre-arranged demonstration of the latest lighting devices at the Edison Laboratories in Harrison, New Jersey.

After Dr. Wilmer's address on December 3rd, a resolution was adopted appealing to Congress for better support of the national bureaus striving to eliminate trachoma.

Book Reviews

The Adolescent Girl, A Book for Parents and Teachers, by Winifred Richmond, Ph.D., Macmillan Company, New York and Toronto. $1.00.

"The first task of education is the provision of an environment in which the body can thrive and develop its highest possibilities, and to do this we must know the girl's physical needs and abilities". This is really the text of "The Adolescent Girl", which is a singularly clear, concise and careful dissection by Dr. Richmond of all the problems to be faced if we are to understand the physical, mental or moral needs of the normal adolescent girl, and if we are to be able to diagnose or help the subnormal, abnormal or delinquent types of girl with whom our social machinery has to deal so constantly. Dr. Richmond's handling of her subject makes instructive reading from cover to cover of this little volume, but in the first four chapters which deal with The Adolescent Girl in Earlier Times; Puberty, What it is and what it means; The Abnormal Girl and the Delinquent Girl, there is much matter of first rate importance and interest.

In her preliminary historical and ethnological retrospect through the ages back to the youth of youth, in her treatment of the view taken of adolescence and puberty from tribal days onward, Dr. Richmond lays a solid foundation for some of her later conclusions and succeeds in exploding many erroneous beliefs by showing on what an insecure foundation many of them rest.

In the succeeding chapters on the Abnormal and Delinquent Girl, the author makes an analysis of many well-known types of departures from the normal before attempting to define the normal girl or to enter into a close consideration of present day adolescents or their problems.

The Essentials of Healthful Living, by William S. Sadler, M.D. F.A.C.S., MacMillan Co., New York and Toronto. $3.85.

Dr. Sadler's books on health subjects are well known. They are held in high regard by both medical men and laymen on this continent and in Europe.

This volume is in many regards a gathering up and recapitulation of some of the earlier works from his pen. It not only deals with the latest known methods of preventing disease through a careful practice of personal hygiene, but also directs attention to the absolute necessity for a knowledge and observance of the principles of community and public hygiene. From the medical angle the book is of great value, because it summarizes the most recent knowledge concerning many of the "obscure" diseases, such as influenza, infantile paralysis, pellagra,

hay fever, and cancer; because it contributes interesting facts regarding differential diagnosis and therapy; and because it centres so rigidly on our dietetic errors as perhaps the most fundamental aspect of modern preventive medical science.

For the lay reader the book's value can be scarcely overestimated. Dr. Sadler, in an early chapter, says: "Personal hygiene is the keynote to the health teaching of the coming generation, and all our past achievements will not serve to stay the tide of increasing diseases or to bring about an improvement in our death rate from the 'habit disorders' until we, as a nation, have passed through the experience and enjoy the benefits of a real hygienic revival."

For such a revival this notable teacher has well prepared the way by so admirably stating the essentials indispensable to healthful living. The average medical man is not a teacher. He has neither time nor talent for instructing an ignorant laity. But in the ever-increasing number of outstanding figures in the ranks of medical prophets, such as William Sadler, Albert Ernest Wiggam, Arbuthnot Lane, Edward Hutchinson, R. S. Copeland, may be discerned the unmistakable signs of the times. The next step in preventive medicine is the education of the laity to a high standard of intelligence regarding personal and social hygiene. Until that has been widely attained, and people have begun to act on their knowledge, the fight against disease will not make adequate progress.

Dr. Sadler's book is of immense usefulness in this direction. It would pay governments to put such books in every home. It would be an enlightened policy to have them in every school, college and public library. And even at the present high cost of books it is well worth while for the average householder to buy this type of scientific advice rather than the often equally expensive but less effective "patent" medicine. We commend the Sadler "Essentials" to all who are interested in public or personal health.

Editorial

RURAL AND URBAN HEALTH

An interesting editorial in the JOURNAL of the American Medical Association deals with health in rural and urban communities, and brings to light some interesting and generally unthoughtof comparisons.

The editorial quotes from the findings of Wood, who concluded from the examination of more than half a million school children that physical defects are greater in rural than in urban children; also from Shepherd and Diehl, who find from examination of students at a representative State University that those who have been raised in villages and on farms show more physical defects and more multiple defects than those raised in large cities. It seems that students raised in cities of more than 50,000 population show the lowest number of physical defects, and that as the result of studies made in groups of 5,000 students from various sized communities one is able to come to certain conclusions which appear to be of value. In the studies of Shepherd and Diehl students from rural communities "are highest in past histories of pleurisy, pneumonia, rheumatism, small pox and tuberculosis; they are lowest in respect to chicken pox, diphtheria, tonsilitis, typhoid fever and whooping cough. Students from cities of more than 50,000 population are lowest in past histories of appendicitis, influenza, measles, mumps, pleurisy and small pox, but highest in the early incidence of chorea. The city and the country vie with one another, the record for low incidence of common maladies being slightly in favor of the largest cities."

Some of the above statements will come as a shock to advocates of the simple rural life as an aid to health and longevity, and should provide more ammunition for the advocates of the county or combined area health unit.

THE CONVENTION IN MAY

The Annual Meetings of the Canadian Public Health Association, the Canadian Social Hygiene Council and the Ontario Health Officers' Association will be held in Toronto during the week commencing May 3rd, it having been found possible to hold the meeting at this time rather than in June.

A Convention Committee composed of representatives of the three organizations is hard at work, and it is expected that a very attractive programme will be made available.

Some section meetings will be arranged for, as well as general sessions of the three associations. In addition there will be several evening meetings which will be of interest to the general public. Speakers from both Canada and the United States will be present, and the subjects discussed will be of vital interest. Matters such as Immunization against Scarlet Fever and Diphtheria and Periodic Health Examination will be important topics of discussion, and every effort will be made to obtain the co-operation of the various interested bodies in Toronto in order to make the event a success.

All readers of the JOURNAL should mark this date on their calendars now and resolve to be present without fail during the entire week of May 3rd.